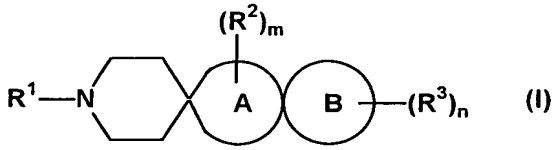
CLAIMS

1. A spiroheterocyclic ring derivatives of the formula (I)



(I)

wherein R^1 is:

(1) hydrogen,

(2) C1-18 alkyl,

(3) C2-18 alkenyl,

(4) C2-18 alkynyl,

(5) $-COR^6$,

(6) $-CONR^7R^8$,

(7) $-COOR^9$,

(8) $-SO_2R^{10}$,

(9) $-COCOOR^{11}$,

(10) $-CONR^{12}COR^{13}$,

(11) Cyc 1, or

(12) C1-18 alkyl, C2-18 alkenyl or C2-18 alkynyl substituted by 1-5 substituent(s) selected from (a) halogen, (b) $-CONR^7R^8$, (c) $-COOR^9$, (d) $-OR^{14}$, (e) $-SR^{15}$, (f) $-NR^{16}R^{17}$, (g) $-NR^{18}COR^{19}$, (h) $-SO_2NR^{20}R^{21}$, (i) $-OCOR^{22}$, (j) $-NR^{23}SO_2R^{24}$, (k) $-NR^{25}COOR^{26}$, (l) $-NR^{27}CONR^{28}R^{29}$, (m) Cyc 1, (n) keto or (o) $-N(SO_2R^{24})_2$,

wherein R^6-R^9, R^{11}-R^{21}, R^{23}, R^{25} and R^{27}-R^{29} are each independently:

(1) hydrogen,

(2) C1-8 alkyl,

(3) C2-8 alkenyl,

(4) C2-8 alkynyl,

(5) Cyc 1, or

(6) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by 1-5 substituent(s) selected from (a) Cyc 1, (b) halogen, (c) $-OR^{30}$, (d) $-SR^{31}$, (e) $-NR^{32}R^{33}$, (f) $-COOR^{34}$, (g) $-CONR^{35}R^{36}$, (h) $-NR^{37}COR^{38}$, (i) $-NR^{39}SO_2R^{40}$ or (j) $-N(SO_2R^{40})_2$, or

R^7 and R^8, R^{20} and R^{21}, R^{28} and R^{29}, taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR^{195}-(C2-6 alkylene)-,

R^{195} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

R^{10}, R^{22}, R^{24} and R^{26} are each independently:

(1) C1-8 alkyl,

(2) C2-8 alkenyl,

(3) C2-8 alkynyl,

(4) Cyc 1, or

(5) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by 1-5 substituent(s) selected from (a) Cyc 1, (b) halogen, (c) $-OR^{30}$, (d) $-SR^{31}$, (e) $-NR^{32}R^{33}$, (f) $-COOR^{34}$, (g) $-CONR^{35}R^{36}$, (h) $-NR^{37}COR^{38}$, (i) $-NR^{39}SO_2R^{40}$ or (j) $-N(SO_2R^{40})_2$,

R^{30}-R^{37} and R^{39} are each independently, hydrogen, C1-8 alkyl, Cyc 1 or C1-8 alkyl substituted by Cyc 1, or

R^{35} and R^{36}, taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR^{196}-(C2-6 alkylene)-,

R^{196} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

R^{38} and R^{40} are each independently C1-8 alkyl, Cyc 1 or C1-8 alkyl substituted by Cyc 1,

Cyc 1 is a C3-15 mono, bi- or tri-(fused or spiro)carbocyclic ring or a 3-15 membered mono-, bi- or tri-(fused or spiro)cyclic hetero ring containing 1-4 nitrogen atom(s), 1-3 oxygen atom(s) and/or 1-3 sulfur atom(s),

Cyc 1 may be substituted by 1-5 of R^{51},

R^{51} is:

(1) C1-8 alkyl,

(2) C2-8 alkenyl,

(3) C2-8 alkynyl,

(4) halogen,

(5) nitro,

(6) trifluoromethyl,

(7) trifluoromethoxy,

(8) nitrile,

(9) keto,

(10) Cyc 2

(11) $-OR^{52}$,

(12) $-SR^{53}$,

(13) $-NR^{54}R^{55}$,

(14) $-COOR^{56}$,

(15) $-CONR^{57}R^{58}$,

(16) $-NR^{59}COR^{60}$,

(17) $-SO_2NR^{61}R^{62}$,

(18) $-OCOR^{63}$,

(19) $-NR^{64}SO_2R^{65}$,

(20) $-NR^{66}COOR^{67}$,

(21) $-NR^{68}CONR^{69}R^{70}$,

(22) $-B(OR^{71})_2$,

(23) $-SO_2R^{72}$,

(24) $-N(SO_2R^{72})_2$, or

(25) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by 1-5 substituent(s) selected from (a) halogen, (b) Cyc 2, (c) $-OR^{52}$, (d) $-SR^{53}$, (e) $-NR^{54}R^{55}$, (f) $-COOR^{56}$, (g) $-CONR^{57}R^{58}$, (h) $-NR^{59}COR^{60}$, (i) $-SO_2NR^{61}R^{62}$, (j) $-OCOR^{63}$, (k) $-NR^{64}SO_2R^{65}$, (l) $-NR^{66}COOR^{67}$, (m) $-NR^{68}CONR^{69}R^{70}$, (n) $-B(OR^{71})_2$, (o) $-SO_2R^{72}$, (p) $-N(SO_2R^{72})_2$ or (q) keto,

R^{52}-R^{62}, R^{64}, R^{66} and R^{68}-R^{71} are each independently 1) hydrogen, 2) C1-8 alkyl, 3) C2-8 alkenyl, 4) C2-8 alkynyl, 5) Cyc 2 or 6) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 2, $-OR^{73}$, $-COOR^{74}$ or $-NR^{75}R^{76}$, or

R^{57} and R^{58}, R^{61} and R^{62}, R^{69} and R^{70}, taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR^{197}-(C2-6 alkylene)-,

R^{197} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

R^{63}, R^{65}, R^{67} and R^{72} are each independently 1) C1-8 alkyl, 2) C2-8 alkenyl, 3) C2-8 alkynyl, 4) Cyc 2 or 5) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 2, $-OR^{73}$, $-COOR^{74}$ or $-NR^{75}R^{76}$,

R^{73}-R^{76} are independently hydrogen, C1-8 alkyl, Cyc 2 or C1-8 alkyl substituted by Cyc 2,

Cyc 2 has the same meaning as Cyc 1,

Cyc 2 may be substituted by 1-5 of R^{77},

R^{77} is:

1) C1-8 alkyl,

2) halogen,

3) nitro,

4) trifluoromethyl,

5) trifluoromethoxy,

6) nitrile,

7) $-OR^{78}$,

8) $-NR^{79}R^{80}$,

9) $-COOR^{81}$,

10) $-SR^{82}$,

11) $-CONR^{83}R^{84}$,

12) C2-8 alkenyl,

13) C2-8 alkynyl,

14) keto,

15) Cyc 6,

16) $-NR^{161}COR^{162}$,

17) $-SO_2NR^{163}R^{164}$,

18) $-OCOR^{165}$,

19) $-NR^{166}SO_2R^{167}$,

20) $-NR^{168}COOR^{169}$,

21) $-NR^{170}CONR^{171}R^{172}$,

22) $-SO_2R^{173}$,

23) $-N(SO_2R^{167})_2$, or

24) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by 1-5 substituent(s) selected from (a) halogen, (b) $-OR^{78}$, (c) $-NR^{79}R^{80}$, (d) $-COOR^{81}$, (e) $-SR^{82}$, (f) $-CONR^{83}R^{84}$, (g) keto, (h) Cyc 6, (i) $-NR^{161}COR^{162}$, (j) $-SO_2NR^{163}R^{164}$, (k) $-OCOR^{165}$, (l) $-NR^{166}SO_2R^{167}$, (m) $-NR^{168}COOR^{169}$, (n) $-NR^{170}CONR^{171}R^{172}$, (o) $-SO_2R^{173}$ or (p) $-N(SO_2R^{167})_2$,

R^{78}-R^{84}, R^{161}-R^{164}, R^{166}, R^{168} and R^{170}-R^{172} are each independently (a) hydrogen, (b) C1-8 alkyl, (c) C2-8 alkenyl, (d) C2-8 alkynyl, (e) Cyc 6 or (f) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 6, $-OR^{174}$, $-COOR^{175}$, $-NR^{176}R^{177}$ or $-CONR^{178}R^{179}$, or

R^{83} and R^{84}, R^{163} and R^{164}, R^{171} and R^{172}, taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR^{198}-(C2-6 alkylene)-,

R^{198} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

R^{165}, R^{167}, R^{169} and R^{173} are each independently (a) C1-8 alkyl, (b) C2-8 alkenyl, (c) C2-8 alkynyl, (d) Cyc 6 or (e) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 6, $-OR^{174}$, $-COOR^{175}$, $-NR^{176}R^{177}$ or $-CONR^{178}R^{179}$,

R^{174}-R^{177} are each independently (1) hydrogen, (2) C1-8 alkyl, (3) Cyc 6 or (4) C1-8 alkyl substituted by Cyc 6, or

R^{178} and R^{179}, taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR^{199}-(C2-6 alkylene)-,

R^{199} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

Cyc 6 is a C3-8 mono-carbocyclic ring or a 3-8 membered mono-cyclic hetero ring containing 1-4 nitrogen atom(s), 1-2 oxygen atom(s) and/or 1-2 sulfur atom(s),

Cyc 6 may be substituted by 1-5 of R^{180},

R^{180} is:

(1) C1-8 alkyl,

(2) halogen,

(3) nitro,

(4) trifluoromethyl,

(5) trifluoromethoxy,

(6) nitrile,

(7) $-OR^{181}$,

(8) $-NR^{182}R^{183}$,

(9) $-COOR^{184}$,

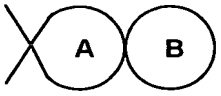
(10) $-SR^{185}$, or

(11) $-CONR^{186}R^{187}$,

R^{181}-R^{187} are each independently (1) hydrogen, (2) C1-8 alkyl, (3) phenyl or (4) C1-8 alkyl substituted by phenyl, or

R^{182} and R^{183}, R^{186} and R^{187}, taken together, are (1) C2-6 alkylene, (2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, (3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or (4) -(C2-6 alkylene)-NR^{200}-(C2-6 alkylene)-,

R^{200} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,



is (i) a fused bi-cyclic ring which A ring and B ring bound by two atoms or (ii) a spiro ring which A ring and B ring bound by spiro,

A ring is (i) a C5 or 6 partially or fully saturated carbocyclic ring or (ii) a 5 or 6 membered partially or fully saturated hetero ring containing 1-3 hetero atom(s) selected from a nitrogen atom(s), an oxygen atom(s) and/or a sulfur atom(s),

B ring is (i) a C4-7 partially or fully saturated carbocyclic ring or (ii) a 4-7 membered partially or fully saturated hetero ring containing 1-3 hetero atom(s) selected from a nitrogen atom(s), an oxygen atom(s) and/or a sulfur atom(s),

R^2 is:

(1) keto,

(2) thioketo,

(3) C1-8 alkyl,

(4) C2-8 alkenyl,

(5) C2-8 alkynyl,

(6) $-OR^{90}$,

(7) Cyc 3, or

(8) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by 1-5 substituent(s) selected from (a) halogen, (b) $-OR^{90}$, (c) $-SR^{91}$, (d) $-NR^{92}R^{93}$, (e) $-COOR^{94}$,

(f) -$CONR^{95}R^{96}$, (g) -$NR^{97}COR^{98}$, (h) -$SO_2NR^{99}R^{100}$, (i) -$OCOR^{101}$, (j) -$NR^{102}SO_2R^{103}$, (k) -$NR^{104}COOR^{105}$, (l) -$NR^{106}CONR^{107}R^{108}$, (m) Cyc 3, (n) keto or (o) -$N(SO_2R^{103})_2$,

R^{90}-R^{100}, R^{102}, R^{104} and R^{106}-R^{108} are each independently (1) hydrogen, (2) C1-8 alkyl, (3) C2-8 alkenyl, (4) C2-8 alkynyl, (5) Cyc 3 or (6) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 3, or

R^{95} and R^{96}, R^{99} and R^{100}, R^{107} and R^{108}, taken together, are (1) C2-6 alkylene, (2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, (3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or (4) -(C2-6 alkylene)-NR^{202}-(C2-6 alkylene)-,

R^{202} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

R^{101}, R^{103} and R^{105} are each independently (1) C1-8 alkyl, (2) C2-8 alkenyl, (3) C2-8 alkynyl or (4) Cyc 3, or (5) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 3,

Cyc 3 has the same meaning as Cyc 1,

Cyc 3 may be substituted by 1-5 of R^{109},

R^{109} has the same meaning as R^{51},

R^3 is:

(1) C1-8 alkyl,

(2) C2-8 alkenyl,

(3) C2-8 alkynyl,

(4) -$COOR^{120}$,

(5) -$CONR^{121}R^{122}$,

(6) Cyc 4, or

(7) -OR^{123},

(8) -COR^{131},

(9) -SO_2R^{133}, or

(10) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by a substituent(s) selected from (a) halogen, (b) nitrile, (c) Cyc 4, (d) -$COOR^{120}$, (e) -$CONR^{121}R^{122}$,

(f) $-OR^{123}$, (g) $-SR^{124}$, (h) $-NR^{125}R^{126}$, (i) $-NR^{127}COR^{128}$, (j) $-SO_2NR^{129}R^{130}$, (k) $-OCOR^{131}$, (l) $-NR^{132}SO_2R^{133}$, (m) $-NR^{134}COOR^{135}$, (n) $-NR^{136}CONR^{137}R^{138}$ or (o) keto,

R^{120}-R^{130}, R^{132}, R^{134} and R^{136}-R^{138} are each independently (1) hydrogen, (2) C1-8 alkyl, (3) C2-8 alkenyl, (4) C2-8 alkynyl, (5) Cyc 4 or (6) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 4, halogen, $-OR^{148}$, $-SR^{149}$, $-COOR^{150}$ or $-NHCOR^{141}$, or

R^{121} and R^{122}, R^{129} and R^{130}, R^{137} and R^{138}, taken together, are 1) C2-6 alkylene, 2) -(C2-6 alkylene)-O-(C2-6 alkylene)-, 3) -(C2-6 alkylene)-S-(C2-6 alkylene)- or 4) -(C2-6 alkylene)-NR^{202}-(C2-6 alkylene)-,

R^{202} is hydrogen, C1-8 alkyl, phenyl or C1-8 alkyl substituted by phenyl,

R^{131}, R^{133} and R^{135} are each independently (1) C1-8 alkyl, (2) C2-8 alkenyl, (3) C2-8 alkynyl, (4) Cyc 4 or (5) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 4, halogen, $-OR^{148}$, $-SR^{149}$, $-COOR^{150}$ or $-NHCOR^{141}$,

R^{141} is (1) C1-8 alkyl, (2) C2-8 alkenyl, (3) C2-8 alkynyl, (4) Cyc 4 or (5) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 4,

R^{148}-R^{150} are each independently (1) hydrogen, (2) C1-8 alkyl, (3) C2-8 alkenyl, (4) C2-8 alkynyl, (5) Cyc 4 or (6) C1-8 alkyl, C2-8 alkenyl or C2-8 alkynyl substituted by Cyc 4,

Cyc 4 has the same meaning as Cyc 1,

Cyc 4 may be substituted by 1-5 of R^{144},

R^{144} has the same meaning as R^{51},

m is 0-5,

n is 0-5,

when m is 2-5, then R^2 of m are the same or different,

when n is 2-5, then R^3 of n are the same or different,

a quaternary ammonium salt thereof, an N-oxides thereof or a non-toxic salt thereof.

2. The compound according to claim 1, which is

(1) (3R)-1-butyl-2,5-dioxo-3,4-(2-thiapropano)-9-[(1,4-benzodioxan-6-yl)methyl]-1,4,9-triazaspiro[5.5]undecane,

(2) (3R)-1-butyl-2,5-dioxo-3,4-(2-thiapropano)-9-[(4-phenoxyphenyl)methyl]-1,4,9-triazaspiro[5.5]undecane,

(3) (3S)-1-(2-methylpropyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(4) (3S)-1-(1-benzyl-4-pyperidinyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(5) (3S)-1-(2,2-diphenylpropyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(6) 1-(2-furanylmethyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,

(7) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,

(8) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,

(9) 1,9-dibenzyl-2,5-dioxo-3,4-propano-1,4,9-triazaspiro[5.5]undecane,

(10) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,

(11) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,

(12) 1-propyl-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,

(13) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,

(14) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(15) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(16) 1-benzyl-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(17) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(18) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(19) 1-propyl-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(20) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-(2-phenylethyl)-1,4,9-triazaspiro[5.5]undecane,

(21) 1-(2-furanylmethyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(22) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(23) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(24) 1-benzyl-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(25) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(26) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(27) 1-propyl-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(28) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-(3-phenylpropyl)-1,4,9-triazaspiro[5.5]undecane,

(29) 1-(2-furanylmethyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(30) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(31) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(32) 1-benzyl-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(33) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(34) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(35) 1-propyl-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(36) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-(4-phenylbutyl)-1,4,9-triazaspiro[5.5]undecane,

(37) 1-(2-furanylmethyl)-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(38) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(39) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(40) 1-benzyl-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(41) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(42) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(43) 1-propyl-2,5-dioxo-3,4-propano-9-phenyl-1,4,9-triazaspiro[5.5]undecane,

(44) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(45) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(46) 1-benzyl-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(47) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(48) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(49) 1-propyl-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(50) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-(5-phenylpentyl)-1,4,9-triazaspiro[5.5]undecane,

(51) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(52) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(53) 1-benzyl-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(54) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(55) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(56) 1-propyl-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(57) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(58) 1-(2-furanylmethyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(59) 1-(2-tetrahydrofuranylmethyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(60) 1-(2-(3-indole)ethyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(61) 1-benzyl-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(62) 1-(2,2-diphenylethyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(63) 1-(2-phenylethyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(64) 1-propyl-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(65) 1-(1-benzyl-3-pyrrolidinyl)-2,5-dioxo-3,4-propano-9-methyl-1,4,9-triazaspiro[5.5]undecane,

(66) (3S)-1-propyl-2,5-dioxo-3,4-((2R)-2-benzyloxy-1,3-propano)-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(67) (3R)-1-propyl-2,5-dioxo-3,4-(2-thiapropano)-9-(6-phenylhexyl)-1,4,9-triazaspiro[5.5]undecane,

(68) 1-butyl-2,5-dioxo-3,3-butano-9-benzyl-1,4,9-triazaspiro[5.5]undecane,

(69) 1-butyl-2,5-dioxo-3,3-butano-1,4,9-triazaspiro[5.5]undecane, or

(70) 1-butyl-2,5-dioxo-3,3-butano-9-[4-(4-methylcarbamoylphenoxy)benzyl]-1,4,9-triazaspiro[5.5]undecane,

a quaternary ammonium salt thereof, an N-oxide thereof or a non-toxic salt thereof.

3. A pharmaceutical composition comprising the triazaspiro[5.5]undecane derivative of the formula (I) according to claim 1, a quaternary ammonium salt thereof, an N-oxide thereof or a non-toxic salt thereof, as an active ingredient.

4. A chemokine/chemokine regulator comprising the triazaspiro[5.5]undecane derivative of the formula (I) according to claim 1, a quaternary ammonium salt thereof, an N-oxide thereof or a non-toxic salt thereof, as an active ingredient.

5. A prevention and/or treatment agent for asthma, atopic dermatitis, urticaria, allergic bronchopulmonary aspergillosis, allergic eosinophilic gastroenteritis, nephritis, nephropathy, hepatitis, arthritis, rheumatoid arthritis, psoriasis, rhinitis, conjunctivitis, ischemic reperfusion disorder, multiple sclerosis, ulcerative colitis, adult respiratory distress syndrome, cytotoxic shock, diabetes, autoimmune disease, multiple organ failure, immunosuppression, cancer metastasis and acquired immune deficiency syndrome, comprising the triazaspiro[5.5]undecane derivative of the formula (I) according to claim 1, a quaternary ammonium salt thereof, an N-oxide thereof or a non-toxic salt thereof, as an active ingredient.